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A framework for value realization during deployment of enterprise information systems

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Abstract

This paper proposes a framework for the realisation of business value during the deployment of enterprise information systems (EIS). Current research establishes that investments in IT can create value, but gives limited guidance on the mechanics of how to manage the realisation of value related to IT. This paper draws on case studies and in-depth interviews to add the granularity needed to guide decision makers and project teams in planning and realizing value during EIS deployment. The framework proposes a holistic approach in which combined investments in EIS and organisation enables efficient and effective processes that in turn drive customer and financial performance.

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Keywords: Enterprise information system; business value

1. Introduction

The motivation for this paper stems from a specific business setting of a multi-national beverage provider that was rolling out an enterprise information system (EIS) based on SAP in several of its bottling franchises.

The author of the paper acted as change management consultant for these roll-outs from 2010 to 2013, giving opportunity to assess business cases and change strategies of each project. These assessments consistently showed a limited view on the expected value that the projects would return, which was surprising in the light of the investments involved, ranging from USD 25 000 to USD 250 000. Typical replies to the question of expected value

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were ‘we want to go live without damaging the business’ (limited by functional IT perspective), ‘we want to standardize processes over geographical regions’ (limited by pressures from current operational issues) or ‘we want to save costs in all departments’ (limited by the perspective that value from EIS stems from reducing costs). Common to these and other examples is a perspective on value that is arbitrarily limited by the interests, attitudes or knowledge of those defining the direction of the project.

The aim of this paper is to explore the value that can be realized from EIS and provide a conceptual framework to guide decision makers and project teams to take a more holistic approach to defining and realizing value from EIS deployment programs.

From an academic perspective, this paper builds on current research around the value of IT from a resource-based view [11-14]. The paper attempts to extend this research by adding the more granular insights into the mechanics of how IT contributes to value creation. These insights are needed to create a framework that can be applied to real-life projects.

This paper does not build on research on IT-business alignment [22-25], though it relates to it in as much as strategic integration [25] is required to initiate an EIS deployment program in the first place, and functional integration [25] will be required to successfully apply the framework to the execution of an EIS deployment program.

The benefits of this research are the additional insights into the more granular mechanics of how IT drives value, and its applicability to the context of real-life EIS deployment projects.

2. Background – value of IT

This section is based on a literature review of current research into the value of IT. Lim et.al’s. [12] meta-analysis shows a strong consensus that IT investments increase the financial performance of a firm based on both accounting-based measures such as Return on Capital Employed or Economic Profit or market-based measures such as tobin’s q. These benefits, however, are only realized if IT is properly managed [21]. The mechanisms required to manage IT properly are more elusive, as they cannot be deducted from the correlation between IT investment and company-level metrics.

There is a growing body of research striving to for more granularity by applying a resource based view (RBV) using a balanced scorecard [7] (BSC) approach [11] [13] [14] or a process oriented approach [19].

2.1. Balanced scorecard (BSC) view

A BSC perspective allows for a more holistic view of value than company-level financial metrics by adding dimensions of ‘customer’, ‘internal business process’ and ‘learning and growth’ value. Khallaf et.al. [8] and Radhakrishnan et al. [16] found that it is a combination of people skills and IT investment that impacts business performance, and not IT alone. Brynjolfsson et.al. [2] argue that a combination of IT and organizational investment has a greater impact on performance than IT investments alone. Masli et.al. [13] use an adapted BSC to illustrate how IT needs to be complemented with non-IT investments in the learning and growth area to improve the process dimension of the BSC. Value of IT therefore stems from the ability to contribute in partnership with improved skills and other resources to improved process performance.

2.2. Process view

Looking further into the process perspective, Tallon [19] found that IT impacts performance when the five core processes of Porter’s [15] value chain are configured to match the strategy expressed as the intended value proposition – operational excellence, customer intimacy or product leadership [20]. Whilst a cost leader driving operational excellence will benefit more strongly from efficiency in its production and operations processes, an organization that builds on customer intimacy will benefit more from effective sales and marketing and customer relation processes. The configuration of processes therefore depends on the strategy followed, and will need to define which processes need to be efficient, and which effective.

Essentially there are two ways in which an EIS can enable business processes [6]:

- EIS can automate activities of a business process
- EIS can provide the information required by users to execute activities of a business process

2.3. Organisational capabilities

The view that value from EIS stems from automation or enablement of process steps appears to take an operational stance. This is not the case if process is equated to capability. This represents a resource-based view of an organization, where IT is one of several resources that are combined to create strategic capabilities that provide competitive advantage [4]. Both processes and capabilities require a combination of people, tangible and intangible resources and supporting systems and can be structured by the value chain [4]. The difference is one of perspective which explains why they are frequently viewed separately:

- The process view is operational and measured by economy, efficiency and effectiveness, and seeks operational excellence
- The capability view is strategic and measured by rarity, imitability and substitutability [1] and seeks competitive advantage

Both perspectives are important as they inform the configuration of the value chain: Where a process represents a capability that delivers competitive advantage this needs to be nurtured by improving process effectiveness. Where a process does not deliver competitive advantage, it needs to be efficient to save costs that can be reinvested in competitive processes.

2.4. Summary

To summarise, a framework for value realization from EIS will need to consider how combined investments in EIS and other resources will enable processes (capabilities) that reflect the organizational strategy and drive competitive advantage subsequently improving customer and financial metrics.

3. Method

The empirical research for this paper is based on 7 case studies of EIS deployment in different geographies and cultures, of which the 3 most representative were explored in more depth. Data was captured via document analysis and in-depth interviews and analysed using the Systems Failure Approach [3]. Documents included corporate strategy documents, formal project documentation, presentations by leadership and the project team and e-mail exchanges. Over 20 interviewees were selected to represent a broad set of stakeholder perspectives including project sponsors, managers and team members as well as representatives of the corporate center. Interviews were unstructured and explored the respondent's perspective and interpretations around what is value and how EIS can enable this value. The systems failure approach was used to organize the resulting data systemically and compare this to an idealized systems model to identify strengths and weaknesses.

The input from the empirical research and the literature review fed into the intial design of the EIS value framework. The framework was then reviewed and refined in multiple iterations with the original interviewees to review the interpretation of their input and with other stakeholders of the EIS deployment projects, including the team in charge of the deployment methodology, to ensure multiple perspectives. The following section is a structured compilation of these findings.

4. Enterprise information system (EIS) value framework

4.1. Project phases

The following diagram illustrates typical high-level phases of an EIS deployment project:

Fig. 1. Project phases.

The initiate phase offers opportunity to gain a full understanding of the value potential of a system by relevant stakeholders and how this can serve the business vision and strategy. If an organisation does not yet have experience with integrated systems, this will need to include some education on the principles and benefits of ERP, end-to-end processes and Business Process Management (BPM). During this phase a holistic business case needs to be defined that considers the cost and benefits of all changes to processes, organisation and technology.

During the design, build and deploy phases, the project team and users need to understand how their activities drive end-to-end process value, the needs of their internal or external customer and how performance of their process will be measured. Project milestones should focus not only on technical system implementation, but also on the steps that lead to process and organisational improvements.

A key message here is the need to plan long-term and include a value realization phase. 'Go-live' is the beginning of a longer journey in which the potential of the new system can be realized in a mode of continuous improvement. This avoids a 'go-live and bye' approach, where the delivery of a technical system is considered a success whilst users struggle with new ways of working and the overall business benefit remains unclear. Value realisation requires a transition from a temporary project organization to a long-term value realization organization that needs to be appropriately sponsored and resourced. Value realisation extends EIS deployment from a single project to a multi-year program.

4.2. Value Roadmap

The green bar below is the 'value roadmap' that indicates the appropriate focus to ensure value is realized throughout the initiative:

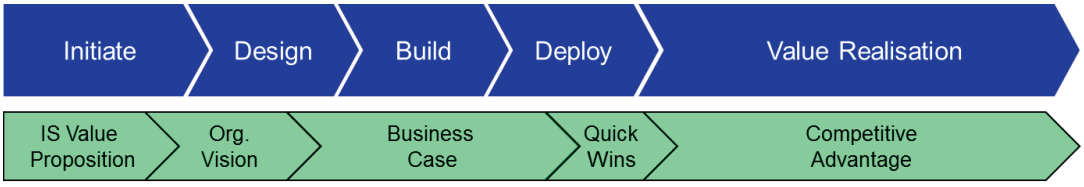

Fig. 2: Value roadmap mapped to project phases

Significant value can only be gained after go-live in a mode of continuous improvement. The scope and complexity of an EIS deployment will only allow for some quick wins from low-hanging fruits at go-live. The business case and the program therefore need to include a specified number of years of value realisation. The individual steps of the value roadmap are described below:

Value Proposition: This refers to the total potential value that the EIS has to offer. For this the initiate phase will include an assessment of the functionality, tools and services of the EIS.

Organisational Vision: The organisational vision should map the potential of the EIS to the organisations needs and the intended business value. A pre-requisite to this assessment is a clear and agreed view of the overall business vision and strategy.

Business Case: Based on the extent to which the EIS can help build strategic capabilities and drive performance, the case for the required investment can be made. The business case should be holistic and include people, process and technological benefits.

Quick Wins: At go live, it is only feasible to get the benefits of low-hanging fruits that can be sufficiently easily implemented. More complex improvements will be implemented during the value realization phase. Apart from being easy to implement, quick wins should be selected based on their relevance to business strategy.

Competitive Advantage: Going live is the beginning of a journey of continuous improvement in which the investment can be leveraged. This will require the organisation to transition from a project organization to a long-term value realisation structure. The value realisation structure needs to be planned for and included in the business case from the outset. It is not sufficient to simply improve performance anywhere, it is necessary to improve performance in areas that drive your strategy, that your customers and consumers value and where you are not already better than your competitors. Putting resources into improvements that customers do not notice and where you outperform competition will represent investments that do not produce returns.

4.3. Benefits 1 - building the foundation

The three boxes on the left of the 'benefits' area in the diagram below relate to the common framework of people (organizational alignment), process (process & data standardization) and technology (system integration):

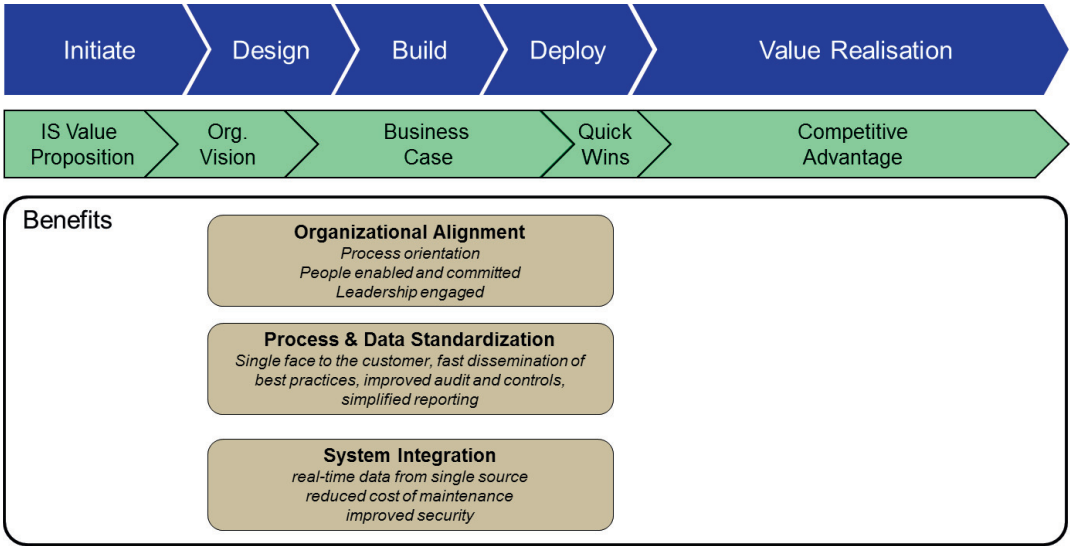

Fig. 3: Benefits 1 – Learning and growth

The three components are interdependent and change together during a business transformation. If there is a central element, it is process. Processes deliver value to customers whilst people and technology are needed to run processes. If a technology change does not support a process improvement there will be no return in value. Therefore an EIS deployment cannot be a limited to the implementation of a new technology, but needs to be organized as a transformation of people, process and technology whereby process is the central element. These three aspects are detailed individually below, but should be seen in conjunction.

Note that the value these three areas provide is limited and cannot be considered a source of competitive advantage. These areas are foundational – stopping the initiative at this point would not justify a significant investment. To get the value of processes need to be improved as described in the next section.

Organizational Alignment: Organizational alignment is not a benefit in its own right, but builds the basis to effectively and efficiently run the intended processes. The organization needs to be aligned to operate the intended processes. This relates to aspects such as structure, accountabilities, incentives, distribution of power and process ownership. Process orientation means people at all levels are held accountable for the execution and outcome of defined processes or sub-processes. This does not replace the functional organization, but complements it. The end-to-end process view focuses on doing the right thing to produce value and drive strategy, whilst the functional view focuses on doing things right by building and applying the right expertise.

Users need be enabled and motivated to run the processes for which they are accountable or responsible, via training and incentives. Leadership needs to be held accountable for reinforcing the new processes and making the change happen.

Ultimately the organization is aligned and skilled to run the new processes using the new system. This is not a benefit in itself, but the standardized way of working and a common language lays the foundation for further improvement throughout the organization during the value realization phase. Without organizational alignment not only will the new processes not run, but future changes are difficult to define as there is no common point of departure and therefore no common path. Organisational change management plays a major role in making the initiative successful.

Process & Data Standardization: Companies that have more standardized digital platforms at the level of systems data and processes have more than twice the chance of getting value out of their investment in these technologies [21]. Process standardisation has some immediate benefits. From an external point of view standard processes enable an organisation to show a single face to customers across plants and regional boundaries, making the bottler an easier supplier to work with.

Internally standards facilitate training and induction of current and new employees. In combination with organizational alignment, standardization will establish a common language and a ‘way of doing things’ as a basis for communities of practice to support continuous improvement. Such improvements can then easily be disseminated in the shape of best practices. Standard documented processes also facilitate audit and controls.

The execution of process steps requires data. Data standardisation is therefore integral to process standardisation when deploying an EIS. Data standardization means that reports over locations will be comparable.

System Integration: An integrated system provides data and information in real-time to all relevant users eliminating the need for separate procedures to transfer data between applications or modules. The immediate availability of data and single source of truth eases monitoring and control of end-to-end operations.

An integrated system can potentially reduce maintenance costs by reducing the diversity of hard- and software platforms and the related expertise to maintain them. This, however, cannot always be realized due to the overall complexity of such systems.

Having a single place to setup users reduces complexity and error that can more easily occur in modular systems which have their own user setup.

4.4. Benefits 2 - realizing the value

Though organizational alignment, process and data standardization and system integration do carry some benefits in their own right, they are essentially foundational to long term value realisation through process improvement. Once the organization is aligned around standard process enabled by an integrated system, any improvement can swiftly be rolled out through the organisation across locations and national borders.

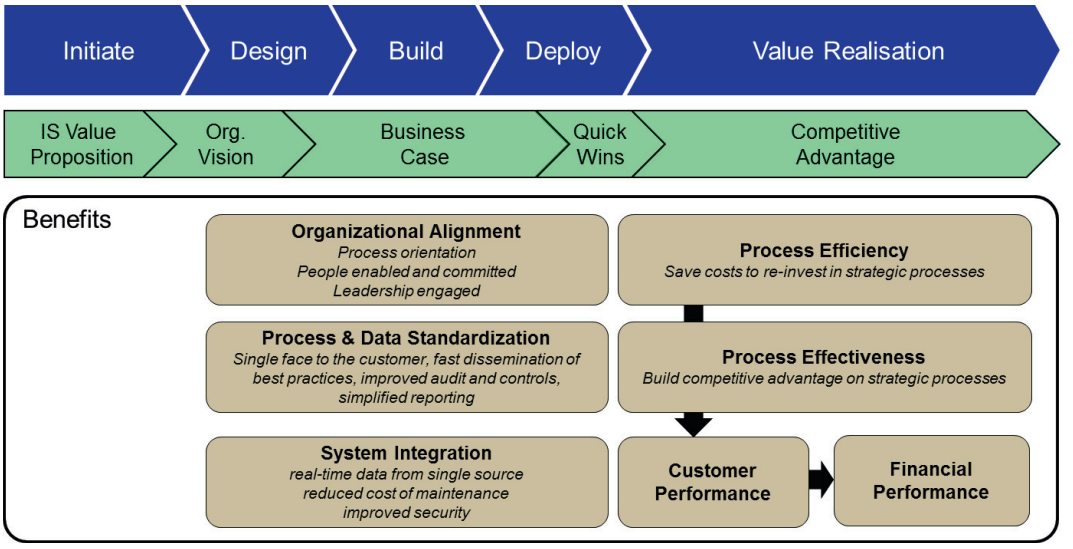

Fig. 4: Benefits 2 - Process, Customer and financial

Process Efficiency: Efficient processes save costs because they consume fewer resources whilst delivering the same output. Efficiency is largely the realm of organizational excellence. An EIS can enable efficiency through automation and by providing useful information to users.

Efficiency should not be for self-sake: the objective is to re-invest saved resources in processes where the bottler strategy requires effectiveness.

Process Effectiveness: Process effectiveness is the ability to outperform competitors in areas that are important to the customer.

This is not just about performing well, but about performing in the right areas, by making a careful decision which processes only need to be efficient, and where you will invest in capabilities that provide competitive advantage.

Customer and financial performance: Building and sustaining such capabilities be will attract customers that are willing to pay, ultimately leading to stronger financial performance.

Analytics: Analytics should measure all aspects of the value framework by mapping these to the BSC. Where organiyational alignment, process and data standardisation and system integration map to the ‘learning and organisation’ dimension of the BSC, process efficiency and process effectiveness map to ‘internal business processes’ dimension.

4.5. Costs

Adding deployment and running costs provides the Total Cost of Ownership (TCO):

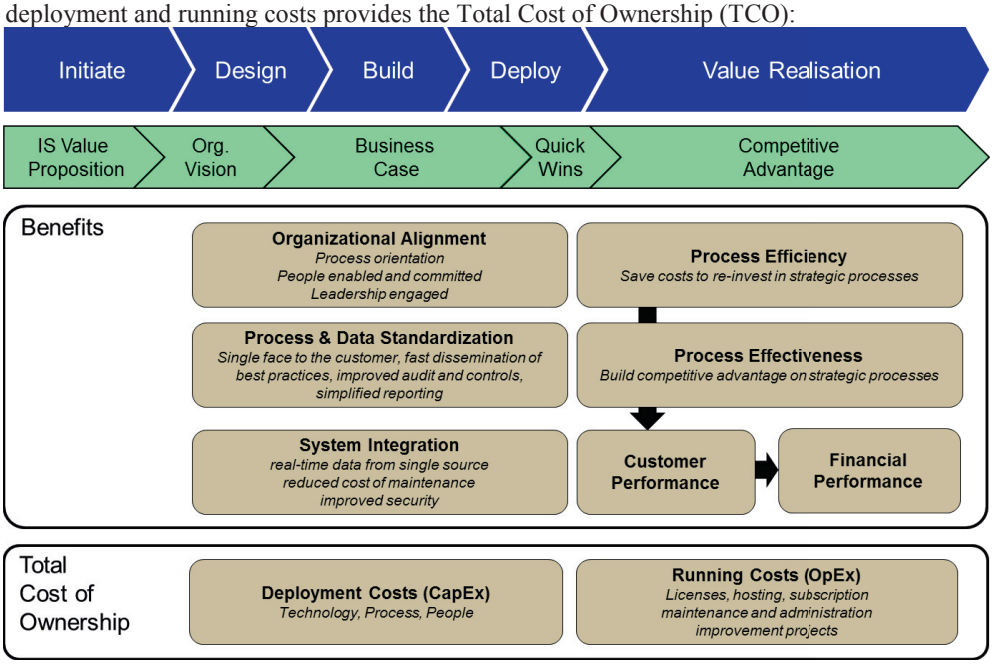

Fig. 5: Total cost of Ownership

The benefits and TCO boxes can be reframed to provide a view on Return on Invested Capital (ROIC). ROIC has a direct on Economic Profit (EP) which is in turn a strong predictor of shareholder value.

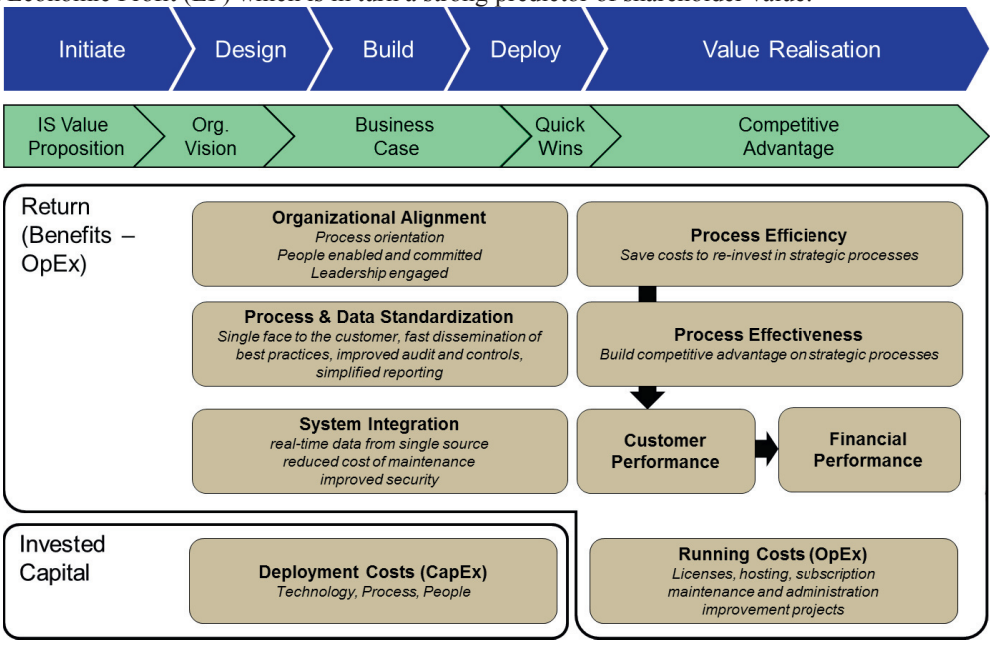

Fig. 6: Return on Invested Capital (ROIC)

5. Guiding Principles to Applying the EIS Value Framework

Whilst the framework provides insight into key concepts on value, guidance is also required how to apply these concepts in a specific project or program.

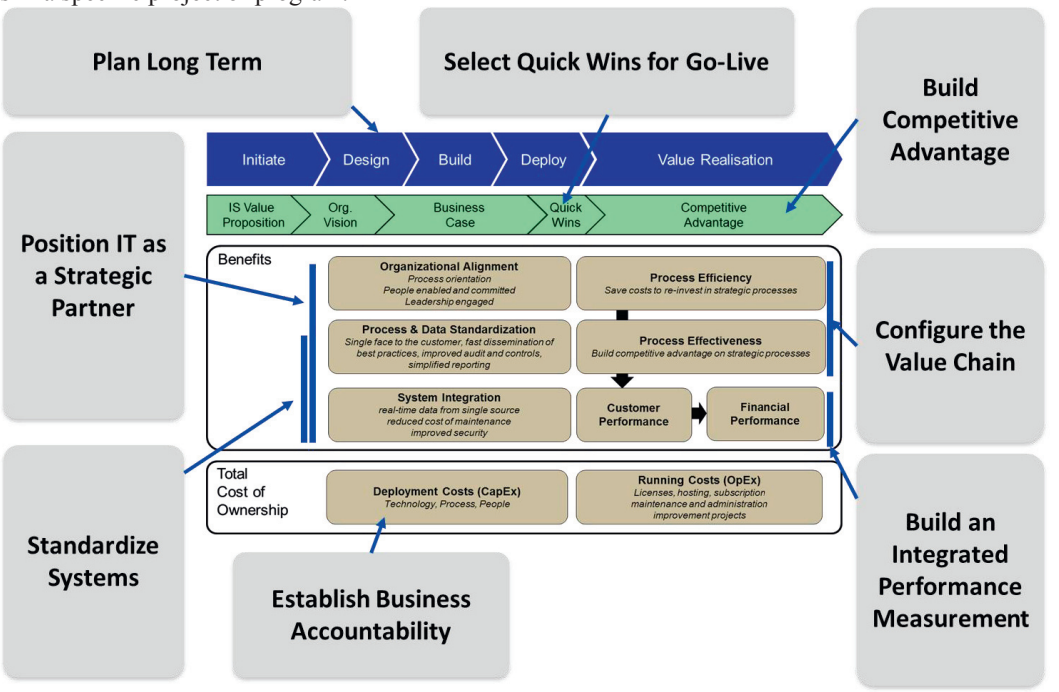

Fig. 7: Guiding Principles

Build an integrated performance management system: IT drives performance by enabling processes, which drives customer value which drives financial value following a balanced scorecard construct. Business leadership is accountable for realizing this value.

Plan long-term: Value proposition and vision need to target a multi-year horizon including a value realization phase. A portfolio of projects up to and following go-live will build the intended value.

Hold business accountable: A key enabler for value is to involve business management in all IT-related investments and management decisions

Position IT as a strategic business partner: Gaining access to both IT-savvy business leaders and business-savvy IT managers makes it more likely to get value [21]. A key enabler for value is to involve business management in all IT-related investments and management decisions [21],

Select quick-wins for go-live: Due to the complexity of deployment, it is not possible to make all process improvements at go-live. Quick wins should be selected that are feasible and add business value.

Establish company-wide standard systems: Companies with standardized digital platforms at the level of systems data and processes have more than twice the chance of getting value out of their investment

Configure the value chain to drive strategy: IT impacts performance when the value chain and processes are configured to match the intended value proposition

Build and sustain competitive advantage: Going live is the beginning of a journey of continuous improvement to perform better than your competitors in areas that are important to your customers

6. Conclusion

The proposed EIS value framework builds on current research on the value of IT and adds the granularity needed to guide projects and programs to realize business value beyond go-live. The framework maps seamlessly to the BSC concept within which EIS is not considered an isolated driver of performance, but part of a long-term holistic business transformation based on a holistic business case.

The benefit of the framework is its tailoring and applicability specifically to real-life EIS deployment programs.

Limitations of the paper are that the data was collected from within a single corporation and that the resulting framework was tested conceptually but not in practice. Future research could test and refine the framework based on its application to EIS deployment programs in various industries. Another area that would benefit from further research is the detailed mechanics how EIS investments need to interact with other organizational resources to provide process performance and capabilities. Such insights would serve to link research on the value of IT with research on business-IT alignment.

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